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| 10/528,832 | 03/23/2005 | Valerio Tognazzo | A-9494 | 3737 |
| 20741 7590 06/26/2009 HOFFMAN WASSON & GITLER, P.C. CRYSTAL CENTER 2, SUITE 522 2461 SOUTH CLARK STREET ARLINGTON, VA 22202-3843 | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary**Application No.**

10/528,832

Applicant(s)

TOGNAZZO, VALERIO

Examiner

IVES WU

Art Unit

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 April 2009.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-28, 30-31, 58-75 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 2, 5, 8, 10, 11 and 58-75 is/are rejected.
7) ☒ Claim(s) 3-4, 6-7, 9, 12-28, 30-31 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____

DETAILED ACTION

(1). Applicants' Request-for-Continued Examination (RCEX), Amendments and Remarks filed on 04/08/2009 have been received.

Claims 5, 19, 21-23 are amended. Claim 1 is cancelled. Total cancelled claims are 1, 29, 32-57.

The rejection of claim 1 in prior Office Action dated 02/04/2008 is withdrawn in response to the current cancellation.

An Office Action is presented in response to the RCEX in the following.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

(2). **Claims 2, 5, 58-75** are rejected under 35 U.S.C. 103(a) as being unpatentable over Starr et al "The capture of airborne particles by water drops and simulated snow crystals", *Quart. J. Roy. Meteor. Soc.* 92:490 (1966), in view of Haruch (US 4343434) and Tognazzo (US05310411A).

As to snowflakes produced within snow producer by sudden cooling of unpolluted water to a temperature substantially below 0°C and acting to capture during their free fall their micropollutants contained in the moisture in a process in **independent claim 75**, Starr et al "The capture of airborne particles by water drops and simulated snow crystals" disclose some preliminary results have been obtained on the collection of pollen grains by circular, hexagonal and star-shaped paper discs that simulate snow crystals (Summary). The capture of particulate matter by falling raindrops and snowflakes is important in the removal of industrial pollutants, radioactive debris, biological organisms and dust from atmosphere. The physics of the problem is also relevant to the suppression of dusts by water sprays and the functioning of spray towers. The experiment now to be described was designed to measure the collection efficiency of simulated snow crystals for solid particles a few microns in radius (Introduction, 1st, 2nd paragraphs). *In Part II. Collection of Particles by Discs Simulating Snow Crystals*. Small circular, hexagonal, and star-shaped discs were cut out of single sheets of Kleenex paper tissue to

produce simulated snow crystals. Since snow crystals sometimes fall in helical path rather than vertically, these discs were released near the ceiling of a box 30 cm * 30 cm * 170 cm high, the top half of which was filled with a cloud of either Lycopodium spores or Paper Mulberry pollen. After falling through 1 m depth of cloud the discs fell on to a clean plate and were quickly covered (page 498, last paragraph). These simulated snow crystals would represent the snow crystals made from unpolluted water because the polluted water would not provide accurate results. Starr et al "The capture of airborne particles by water drops and simulated snow crystals" **do not teach** the snow flakes produced within snow producer by the sudden cooling of unpolluted water to a temperature substantially below 0 °C as claimed.

However, Haruch (US04281518) **teaches** air efficient atomizing spray nozzle (Title). Thus, when this nozzle is utilized for making snow the chosen spray pattern exits from the nozzle orifice and freezes immediately into minute ice crystals (Col. 6, line 8-11).

The advantage of making snow by atomizing nozzle is the ability to operate effectively without the addition of pressurized air, or to use as much, or as little air, as necessitated by the degree of atomization desired, from relative coarse spray particle size afforded by straight hydraulic operation, to the very fine atomized spray particles afforded by added air atomization – wide range of size is controllable (Col. 2, line 3-9).

Therefore, it would have been obvious at time of the invention to carry out experiments of Starr et al by making snow in the spray tower disclosed by Haruch in order to get advantage cited above.

As to step of subjecting a flow of **fumes or** gases and moisture containing micro-pollutants to a flow of only snowflakes within a snow producer in **independent claim 75**, Starr et al "The capture of airborne particles by water drops and simulated snow crystals" disclose the capture of particulate matter by falling raindrops and snowflakes to be important in the removal of industrial pollutants, radioactive debris, biological organisms and dust from atmosphere. The physics of the problem is also relevant to the suppression of dusts by water sprays and the functioning of spray towers. The experiment now to be described was designed to measure the collection efficiency of simulated snow crystals for solid particles a few microns in radius (Introduction, 1st, 2nd paragraphs), it would read on the limitation as claimed.

As to step of discharging from snow producer said snow flakes being reached the bottom of snow producer, snowflakes in the form of polluted water in **independent claim 75**, it would have been obvious to have outlet for discharging in the devices such as spray tower based on continuous operation of engineering practice. Also the snowflakes leaving the snow machine would melt eventually when the concept of snow scrubbing disclosed by Starr et al applies to the real world.

As to step of feeding to a gasifier the resulting polluted water coming from snowflakes englobing the captured micro-pollutants in **independent claim 75**, the melted snow crystals would be obvious to englobe the pollutants as the concept of snow scrubbing disclosed by Starr et al applies to real world. Starr et al "The capture of airborne particles by water drops and simulated snow crystals" **do not teach** a gasifier for the resulting polluted water coming from snowflakes englobing the captured micro-pollutants as claimed.

However, Tognazzo (US05310411A) **teaches** the process and machine for the transformation of combustible pollutants of waste materials into clean energy and usable products (Title). An aim is to optimize the gasification method. A further aim is to carry out the disposal of urban, industrial and agricultural waste aggregates of all types, particularly solid waste materials, black liquor sludge, combustible pollutants etc (Col. 1, line 35-45).

The advantage of gasification is to transform combustible pollutants or waste materials into clean energy and utilizable products (Col. 1, line 8-10, 35-41).

Therefore, it would have been obvious at time of the invention to have the snow crystals in form of polluted water and to install the gasification device of Tognazzo in the spray tower of Starr et al in order to obtain the cited advantage.

As to process for ultra-purifying fumes or gases with total recovery of the resultant pollutants in **independent claim 75**, the disclosure of the reference meets the requirements of present claim both in terms of the elements and their configurations. It is reasonable to presume that the combined teaching of reference would fulfill the same utility of ultrapurifying fumes or gases with total recovery of the resultant pollutants as presently claimed in light of their design similarities. The burden is shifted to Applicants to establish that the present claim is not the same as or obvious as that set forth by the reference.

(3). **Claims 2, 5, 58-74** are rejected under 35 U.S.C. 103(a) as being unpatentable over Starr et al "The capture of airborne particles by water drops and simulated snow crystals", *Quart. J. Roy. Meteor. Soc.* 92:490 (1966), in view of Haruch (US 4343434) and Tognazzo (US 5310411A) for the same rationale recited in prior Office Action dated 02/04/2008.

(4). **Claims 8, 10-11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Starr et al "The capture of airborne particles by water drops and simulated snow crystals", *Quart. J. Roy. Meteor. Soc.* 92:490 (1966), in view of Haruch (US 4343434) and Tognazzo (US 5310411A), further in view of Müller et al (US 4281518), further evidenced by Fukuta (US 5628455A) for the same rationale recited in prior Office Action dated 02/04/2008.

Allowable Subject Matter

(5). **Claims 3-4, 6-7, 9, 12-28, 30-31** are allowed.

Response to Arguments

(6). Applicant's arguments filed on 4/8/2009 have been fully considered but they are not persuasive.

Applicant's argument that unlike the Starr reference, which teaches to submit a flow of gases or fumes to a wash in order to reduce the pollutants, the present invention teaches the step of removing the micro pollutants from a flow of gas or fumes which is already devoid of pollutants (page 2, current Remarks). Starr et al "The capture of airborne particles by water drops and simulated snow crystals", *Quart. J. Roy. Meteor. Soc.* 92:490 (1966), teach the pollutant such as spores of *Lycoperdon* (mean radius 2.25 μ), spores of black rust (mean radius 2.6 μ) (Abstract). Therefore, the pollutants in the teaching of Starr et al include micro-pollutants too.

Applicant asserts that Starr reference washes the gases or fumes with the use of water and, in order to render the wash more effective, it carries it out with cold water, which is more dense. While it is clear that the cooling of the water can lead to the creation of snowflakes, these snowflakes do not exclude the presence of water in the liquid state necessary for carrying out the washing process (page 2, current Remarks).

Starr et al "The capture of airborne particles by water drops and simulated snow crystals", *Quart. J. Roy. Meteor. Soc.* 92:490 (1966), teach the snow crystal scrubbing in Part II, and a preliminary results have been obtained by simulated snow crystals (Abstract). Although it is simulated snow crystals, it would be snow crystals without water as the concept of experiments is applies to the real world.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IVES WU whose telephone number is (571)272-4245. The examiner can normally be reached on 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Examiner: Ives Wu
Art Unit: 1797
Date: June 23, 2009

/DUANE SMITH/
Supervisory Patent Examiner, Art Unit 1797